



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/781,968	02/19/2004	Sezai Sablak	BSS0005	4459

27268 7590 10/18/2007
BAKER & DANIELS LLP
300 NORTH MERIDIAN STREET
SUITE 2700
INDIANAPOLIS, IN 46204

EXAMINER

AGGARWAL, YOGESH K

ART UNIT	PAPER NUMBER
----------	--------------

2622

MAIL DATE	DELIVERY MODE
-----------	---------------

10/18/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/781,968

Applicant(s)

SABLAKE, SEZAI

Examiner

Yogesh K. Aggarwal

Art Unit

2622

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 July 2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 9-20 and 23-31 is/are pending in the application.
- 4a) Of the above claim(s) _____, is/are withdrawn from consideration.
- 5) ☒ Claim(s) 30 and 31 is/are allowed.
- 6) ☒ Claim(s) 1-6, 9, 11-20 and 23, 25-29 is/are rejected.
- 7) ☒ Claim(s) 10 and 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 06/25/2007.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

Response to Arguments

1. Applicant's arguments with respect to claims 1-6, 9-20, 23-31 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-6, 11-20 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Flotow et al. (US PG-PUB # 20040183917) in view of Sezan et al. (US Patent # 5,682,205).
[Claim 1]

von Flotow et al. teaches a video image stabilization system comprising:

a camera (figures 4b and 5 disclose a camera) including an image capturing device configured to capture a video image, said camera having a selectively adjustable field of view (Paragraph 33 teaches camera being controlled by an inertial stabilization system that controls the orientation of the camera); and

at least one processing device (figure 4b disclose an image processor) operably coupled to said system wherein said processing device receives signals indicative of the field of view of said camera and images captured by said camera, said processing device sequentially grabbing a first one of said images and a second one of said images, said processing device determining a stabilizing adjustment for the video image as a function of an intended change in the field of

Art Unit: 2622

view of said camera during an interval between the capture of said first image and said second image based upon said signals indicative of the field of view and an analysis of said first and second images (Paragraphs 33-37, 49 figures 5 and 6).

von Flotow teaches aligning one of said first and second images with the other of said first and second images based upon said signals indicative of the field of view of the aligned first and second images, and compensating for the occurrence of unintentional movement (Paragraphs 35 and 36, the car is placed at the same position in two frames by aligning two frames) but fails to teach determining the occurrence of unintentional camera movement based on movement of a stationary background portion.

However Sezan et al. teaches calculating a single global motion vector, corresponding to a relative translational displacement between the camera and the scene. For example, if the original scene contains a moving object situated against a stationary background, and the camera undergoes a translational motion (e.g., due to hand motion), the background in the video sequence moves in an amount equal to the camera motion and its movement is described by the global motion vector. In such a cases, the invention results in a deinterlaced frame containing a sharp and crisp background that is devoid of aliasing artifacts. Sezan further teaches that estimation and compensation of global motion is computationally less expensive than estimating and compensating for local motion on a pixel-by-pixel basis (col. 5 lines 28-50).

Therefore taking the combined teachings of von Flotow and Sezan, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have determined the occurrence of unintentional camera movement based on movement of a stationary

Art Unit: 2622

background portion because estimation and compensation of global motion is computationally less expensive than estimating and compensating for local motion on a pixel-by-pixel basis.

[Claim 2]

von Flotow teaches wherein a display portion (figure 6 discloses two frames displayed on the monitor) of each image captured by said camera is selected for display, said selected display portion of each image comprising less than the entire captured image and wherein said stabilizing adjustment determined by said processing device comprises adjusting a relative location of said selected display portion within said captured image (Paragraph 35).

[Claim 3]

van Flotow teaches wherein said camera has a selectively adjustable pan position, a selectively adjustable tilt position and a selectively adjustable focal length (Paragraph 33 teaches camera being controlled by an inertial stabilization system that controls the C1, C2 and C3 orientation of the camera corresponding to line of sight i.e. zoom, tilt and scan (pan) of the camera. Zoom changes the focal length of the camera).

[Claim 4]

van Flotow teaches the camera is panning a scene due to a result of the desired movement (Paragraph 36).

[Claim 5]

van Flotow teaches wherein the focal length of said camera is intentionally adjusted between the capture of said first and second images (Paragraph 33 teaches camera being controlled by an inertial stabilization system while taking images that controls the C1, C2 and C3 orientation of the camera corresponding to line of sight i.e. zoom, tilt and scan (pan) of the camera. Zoom

Art Unit: 2622

changes the focal length of the camera. Also see paragraph 36 wherein the stabilization system is provided with aircraft velocity and orientation, camera line of sight (zoom that changes focus) and orientation, and camera scan and tilt rate to estimate and factor out this desired movement before adjusting the image).

[Claim 6]

van Flotow teaches wherein said analysis of said first and second images includes transforming one of said first and second images wherein the scale of the one image is adjusted (Paragraph 35, figure 6, the coordinates of the car are changed from one frame to another).

[Claim 11]

van Flotow teaches wherein said signals indicative of the field of view comprise pan, tilt and focal length settings of said camera for each captured image, said signals being communicated to said processing device (figure 4b disclose an image processor) from said camera (figures 4b and 5 disclose a camera) on an image-synchronized basis (Paragraph 33 teaches camera being controlled by an inertial stabilization system that controls the C1, C2 and C3 orientation of the camera corresponding to line of sight i.e. zoom, tilt and scan (pan) of the camera).

[Claim 12]

van Flotow teaches wherein the camera is mounted on a stationary support (Paragraph 59).

[Claim 13]

van Flotow teaches a video image stabilization system comprising:

a video camera (figure 4b and 5 disclose a camera) including an image-capturing device (an image capturing device is inherently present in a camera) configured to capture images, each captured image associated with a field of view, said camera having at least one selectively

Art Unit: 2622

adjustable parameter wherein adjustment of said at least one camera parameter varies the field of view of said camera (Paragraph 33 teaches camera being controlled by an inertial stabilization system that controls the orientation of the camera);

a display device (figure 6 discloses two frames displayed on the monitor) configured to display a selected portion of images captured by said camera (Paragraph 35); and

a processing device operably coupled to said camera and to said display device wherein said processing device receives signals indicative of said at least one camera parameter and images captured by said camera, said processing device being operable to compensate for inadvertent movement of said video camera by adjusting the selected portion of the images displayed by said display device based upon the signals indicative of said at least one camera parameter and an analysis of a current captured image and a previously captured image (Paragraphs 34-37).

von Flotow teaches aligning one of said first and second images with the other of said first and second images based upon said signals indicative of the field of view of the aligned first and second images, and compensating for the occurrence of unintentional movement (Paragraphs 35 and 36, the car is placed at the same position in two frames by aligning two frames) but fails to teach determining the occurrence of unintentional camera movement based on movement of a stationary background portion.

However Sezan et al. teaches calculating a single global motion vector, corresponding to a relative translational displacement between the camera and the scene. For example, if the original scene contains a moving object situated against a stationary background, and the camera undergoes a translational motion (e.g., due to hand motion), the background in the video

Art Unit: 2622

sequence moves in an amount equal to the camera motion and its movement is described by the global motion vector. In such a cases, the invention results in a deinterlaced frame containing a sharp and crisp background that is devoid of aliasing artifacts. Sezan further teaches that estimation and compensation of global motion is computationally less expensive than estimating and compensating for local motion on a pixel-by-pixel basis.

Therefore taking the combined teachings of von Flotow and Sezan, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have determined the occurrence of unintentional camera movement based on movement of a stationary background portion because estimation and compensation of global motion is computationally less expensive than estimating and compensating for local motion on a pixel-by-pixel basis.

[Claim 14]

van Flotow teaches wherein the selected portion of the video image comprises a signal indicative of pan, zoom and tilt settings (Paragraph 33 teaches camera being controlled by an inertial stabilization system that controls the C1, C2 and C3 orientation of the camera corresponding to line of sight i.e. zoom, tilt and scan (pan) of the camera).

[Claim 15]

van Flotow teaches wherein the selected portion of the video image comprises a central portion of the video image (Paragraph 35, figure 6).

[Claim 16]

van Flotow teaches wherein the selected portion of the video image includes approximately 90 percent of the video image (Paragraph 35).

[Claim 17]

Art Unit: 2622

This is a method claim corresponding to apparatus claims 1, 2 and 12. Therefore claim 17 is analyzed and rejected based upon apparatus claims 1, 2 and 12.

[Claims 18-20]

These are method claims corresponding to apparatus claims 4-6 respectively. Therefore these claims have been analyzed and rejected based upon apparatus claims 4-6 respectively.

[Claim 25]

This is a method claim corresponding to apparatus claims 1 and 2. Therefore claim 25 is analyzed and rejected based upon apparatus claims 1 and 2.

[Claims 26, 27 and 28]

Sezan teaches the estimation and compensation of global motion is based on a movement of stationary background due to the camera movement and not on the moving object that has local motion vectors, it would be obvious to one skilled in the art that at least one moving object is ignored in the determining of the movement and the stabilization. von Flotow teaches aligning one of said first and second images with the other of said first and second images based upon said signals indicative of the field of view of the aligned first and second images, and compensating for the occurrence of unintentional movement based on the position of moving car (Paragraphs 35 and 36, the car is placed at the same position in two frames by aligning two frames)

4. Claims 9 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over von Flotow et al. (US PG-PUB # 20040183917), Sezan et al. (US Patent # 5,682,205) and in further view of Jones (US Patent # 6,809,758).

[Claim 9]

Art Unit: 2622

van Flotow teaches generating image difference of the aligned images but fails to teach generating a histogram and determining whether unintentional camera movement has occurred based upon identifying a maximum peak in said histogram and a location of said maximum peak. However Jones teaches generating histogram and whether unintentional camera movement has occurred based upon identifying a maximum peak in said histogram and a location of said maximum peak (col. 5 line 57-col. 7 line 34, figures 1-4).

Therefore taking the combined teachings of van Flotow, Sezan and Jones, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have determined unintentional camera movement based upon identifying a maximum peak in said histogram and a location of said maximum peak in order to remove unwanted motion from a image without removing desired motion without excessive computational requirements in a fully automatic process (col. 2 lines 12-17).

[Claim 23]

This is a method claim corresponding to apparatus claim 9. Therefore claim 23 is analyzed and rejected based upon apparatus claim 9.

5. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over von Flotow et al. (US PG-PUB # 20040183917), Sezan et al. (US Patent # 5,682,205), Jones (US Patent # 6,809,758) and in further view of Taniguchi (US Patent # 6,456,730).

[Claim 29]

van Flotow in view of Jones fail to teach determining the presence of at least one moving object in the field of view by identifying a secondary peak in said histogram. However Taniguchi teaches that based on the additional moving quantity 19-21 and 9-11 (figure 13), the presence of

Art Unit: 2622

moving objects is determined (col. 7 line 53-col. 8 line 9). Therefore taking the combined teachings of Flotow, Sezan, Jones and Taniguchi, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have determined the presence of at least one moving object in the field of view by identifying a secondary peak in said histogram in order to correctly extract the moving object from the background when a camera is loaded on a moving platform.

Allowable Subject Matter

6. Claims 30 and 31 are allowed. The prior art fails to teach or suggest "A video image stabilization system comprising: "..... generating a histogram of an image difference of said aligned images, and determining whether unintentional camera movement has occurred based upon identifying a maximum peak in said histogram and a location of said maximum peak, wherein when said maximum peak is not substantially centered on zero, unintentional motion is determined to have occurred and wherein determination of said stabilizing adjustment includes identifying adjustments that minimize said image difference".

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

Art Unit: 2622


will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yogesh K. Aggarwal whose telephone number is (571) 272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

8. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571)-272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

YKA
October 6, 2007


LIN YE
SUPERVISORY PATENT EXAMINER